ICT COMPETENCIES OF HIGHER EDUCATION TEACHERS IN PUDUCHERRY REGION

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ABSTRACT

Higher education professionals generally work in an information and communication technology (ICT) rich environment. In this paper, we present the findings of a study of computer competencies of higher education teachers working in the arts and science colleges of Puducherry region. The present research is aimed at answering the research questions about the extent and frequency of the faculty members use of computer applications for teaching learning processes, their main concerns regarding using technology in teaching and their preferences of technology training methods for professional development. Questionnaires, designed to provide an overview of the above said research parameters were administered to the 120 higher education teachers teaching in the arts and science colleges of Puducherry region. These results showed that faculty members are moderately competent in using internet, e-mail, word processing, presentation software, and transparencies and less competent in various other areas of technological tools. Their frequency of use in the moderately competent areas is high when compared to other tools. Therefore, a larger dose of training is required on the use of other technological tools. The main concern of the faculty members in using technology is they do not have proper and adequate technical support and most of them preferred workshop as their training strategy over methods. It can be concluded that with limited knowledge and resources these teachers were able to incorporate technology in their teaching-learning process and if they are provided with adequate training on the advanced technological tools to raise their level of competencies, no doubt they would bring innovations in their classrooms.

Key words*: ICT Competencies, Higher Education Teachers, Technological Tools.*

Rationale of the Study

The benefits of technology in general and ICT in particular are beginning to be felt in the development of human resources in administrative and teaching infrastructures. The integration of technology in the classroom is very helpful for students learning (Collins, 1991and David, 1991) and helps make learning more interactive (Madian, 1991). Information and Communication Technologies (ICT) are seen as important tools of advancement in developing countries. As concluded by Duhaney (2000), the introduction and use of information technology changed the traditional classroom activities and changed the way that teachers and students interact with each other. Technologies have proved to have helped enhancing the learning environment and provide enrichment in the learning process (Duhaney, 2000). With the use of technology, the role of the teacher changes such that he/she is no longer the center of the classroom who passes information and knowledge to students. Students learn through critical thinking, inquiry, and problem solving from information accessed from a variety of sources (Houghton, 1997). Many studies have indicated that the reason for the lack of the use of computer technology by teachers is their lack of training (Vagle & Collece 1995; Yaghi, 1997; Yildirim & Kiraz, 1999). Research have shown that teachers are more hesitant and less likely to use computer technology than other people in other professionals (Paprzycki & Vidakovic, 1994). Research into the competency levels of teachers has shown that teachers' beliefs about using technology for teaching are directly related to their practice (Albion, 1999). Research in Scotland indicated that teachers may be aware of their need to gain adequate skills in using ICT but they suffer from lack of time and resources to develop their skills. They depend on other staff to help them through difficulties in using technology (Williams, et al, 1998).

Research Questions

Specific questions addressed in this study include:

1. To what extent can faculty members in Puducherry colleges use computer applications?
2. How frequent do faculty members use computer applications?
3. What are faculty members' concerns regarding using technology in teaching?
4. What are faculty members' preferences of technology training methods?

Methods and Materials

Subjects

Table 1 shows the group characteristics of the participants taken for this study. The participants for this study were 105 faculty members working in the various arts and science colleges in Puducherry region during the academic year 2009-2010.

Table 1. Group Characteristics

Characteristics		Number	%
Sex	Male	73	69.52
	Female	32	30.47
Age	21-30 yrs	18	17.14
	31-40 yrs	41	39.04
	41-50 yrs	38	36.19
	51-60 yrs	08	7.61
Faculty	Arts	58	55.23
	Science	47	44.76
Computer access	At home	58	55.23
	At office	87	82.85
Internet access	At home	43	40.95
	At office	59	56.19

Materials

Four instruments were used in this study

a. **Computer competency survey**: A researcher made survey that consisted of 14 items on a 5 point Likert scale where 1 = not competent and 5 = very competent. These items addressed the use of computer programs necessary for integrating computer technology in teaching college courses.

b. **Frequency of computer use survey**: A researcher-made survey that consisted of 12 items.

c. **Survey on Faculty concern in using computers**: A researcher- made survey that consisted of 11 items that could be of concern to faculty members when using computers.

d. **Survey on the Choice of Computer Training by Faculty Members:** A researcher- made survey that consisted of 4 items that could be of the preferred choice of computer training by faculty members.

Procedure

All those instruments were given to experts for judging their validity. The experts' comments were studied and the instruments were modified accordingly. The instruments were distributed among the randomly selected faculty members working in the arts and science colleges of Puducherry region. Before this the faculty members' willingness to participate in the research were obtained. 130 teachers were approached and only 114 expressed their willingness. The instruments were distributed to all the 114 faculty members and only 105 returned the instruments in the fully completed form.

Data Analysis

The data collected from the 105 participants were subjected to descriptive statistics of mean and standard deviation for the instruments 1 and 2 and total scores in percentage were calculated for the instruments 3 and 4.

Results and Discussion

Table 2. Computer Competency: Descriptive Statistics

S.No.	Item	Mean (Max=5)	Std. Deviation
1.	Internet and WWW	2.91	0.78
2.	Electronic mail	2.11	0.90
3.	Presentation software (Eg. Power Point)	2.90	0.60
4.	Transparencies	3.25	1.15
5.	Word processing (Eg. Word)	2.20	1.06
6.	Slide projection	2.02	1.03
7.	Slide design	1.91	0.78
8.	Spread sheets (Eg. Excel)	1.75	0.43
9.	Statistical analysis (Eg. SPSS)	1.60	0.42
10.	Special programs (Eg. Online resources, simulation software)	1.05	0.52
11.	Database software (Eg. Database)	1.14	0.49
12.	Drawing programs (Eg. Photoshop)	1.89	0.75
13.	Web design	1.82	0.46
14.	Animation (Eg. Flash)	1.64	0.56

The results on the computer competency survey are shown in Table 2. The means on the 14 items ranged from 1.05 with a standard deviation of 0.52 (Special programs) and 3.25 with a standard deviation of 1.15 (Transparencies). The results show that faculty members are not using other electronic media considerably or regularly. The reason might be due to lack of knowledge, access or other reasons. The means on Presentation software, Transparencies, Word processing and Slide projection were slightly more than 2 indicating an intermediate level of competency. These results suggest that faculty members need training on tools other than these tools to raise their level of competency. On the rest of items, however, the means are less than 1, which means that faculty members are at low level of competency on these tools. Therefore, a larger dose of training is required on the use of these tools.

Table 3. Frequency of Use: Descriptive Statistics

S.No.	Item	Mean (Max=5)	Std. Deviation
1.	E-Mail	3.95	1.08
2.	Internet	3.80	1.12
3.	Transparency	4.43	1.95
4.	Word	2.77	0.85
5.	Power Point	2.39	0.71
6.	Movies	1.29	0.55
7.	Excel	1.15	0.40
8.	Video	1.43	0.49
9.	Graphics	1.34	0.19
10.	SPSS	1.28	0.66
11.	Database	1.30	0.65
12.	Web design	1.09	0.71

Table 3 shows the frequency of the use of computer and computer programs by the faculty members. The means on the 12 items ranged from 1.09 with a standard deviation of 0.71 (Web design) to 3.95 with a standard deviation of 1.08 (E-mail). The top five items are the same as those ranked top five in the computer competency survey (see table 1). This seems to be logical since frequent practice with a program would raise the competency level of using it. On the other hand, it is reasonable to assume that one would use programs that he/she is good at using it. The means on 7 of the items were less than 2. This means that many important computer applications are not utilized for educational use or for personal use.

Table 4. Main Concerns of Faculty Members in Using Technology

S.No.	Common Concerns	Yes%	No %
1.	No technical Support	80.0	20.0
2.	No time	55.5	44.5
3.	Need new computer	65.5	34.5
4.	No proper equipment and software	75.5	24.5
5.	Difficulties in using technology	41.8	58.2
6.	No incentives	30.5	69.5
7.	The cost of using technology	48.2	51.8
8.	Student might be better than me	43.6	56.4
9.	Not enough ability	40.1	59.9
10.	Does not know how to use Internet	58.1	41.9
11.	Don't think student will learn this way	19.1	80.9

Table 4 shows faculty members answers to the items representing their concerns regarding computer use. It can be concluded from table 3 that the common problems that faculty members reported are no technical support, not having enough time, need new computer, no proper equipment and software and difficulties in using technology. 19.1% of the faculty members are of the opinion that they don't think students will learn through computers. This may be due to their negative attitude towards computers or due to lack of exposure to computers applications in eduation.

Table 5. Analysis of the Choice of Training by Faculty Members

S.No.	Training Type	First %	Second %	Third %
1.	Workshop	58.5	20.6	11.4
2.	Peer	12.7	22.6	35.9
3.	One to one	14.9	22.7	20.9
4.	Manual	13.9	34.1	31.8
5.	Total	100	100	100

Table 5 shows the faculty members' preferences of computer training methods. It can be noticed that most of the faculty members first choice was workshops, second choice was the one to one training strategy and the third choice was to provide them them with a manual that would be taught.

Recommendations for Policy Making

Technologies in general and ICT in particular offer vast opportunities for the development of

contacts and exchange of information and knowledge with the rest of the world. Incorporating the technologies successfully in educational institutions requires careful advanced planning and preparation. Significant finance and human resources are required, with training as an essential component of the process. The policy makers have to be prepared to confront bureaucracy and conservative attitudes, including resistance by teachers and other educational staff. The following recommendations may help educational policy makers to incorporate and utilize ICT for education and training in a productive manner:

- Training and orientation of teachers, administrators and students to the new learning technologies is an immediate requirement.
- Teachers should have adequate time to plan the introduction of ICT into their pedagogical practices to ensure high quality and appropriate learning.
- To ensure that teachers, educational authorities and other stakeholders enjoy the maximum benefits from the use of these technologies, all should be involved in information sharing, consultation and negotiations, according to the nature of issue.
- Training and development opportunities should focus on applications and benefits for pupils and teachers and not simply on how to use the technology. This will create the interest and incentive to learn.
- Broadening awareness of a wide range of ICT resources, with equal emphasis on word processing. Presentation software like PowerPoint, spreadsheets like Excel and on resources which are currently underused, such as the Internet and WWW, e-mail, and video conferencing.
- Awareness about ICT as a tool for lifelong learning for teachers as well as their pupils should be created by focusing on the content of ICT, and not only the technology.
- Training must be focused on the types of ICT resources available to teachers in school.
- Training and development must enable teachers to work with a range of computers and operating systems.
- Opportunities for continuing professional development (CPD) need to be available on an ongoing basis - i.e. not only the one-off event but also opportunities for teachers to continue to develop at a pace which suits their local circumstances and resources
- Teachers need to be encouraged to integrate self-development of ICT skills and knowledge into their normal development planning.

Conclusion

There appears to be digital divide in two ways. The first one is the teachers who lack knowledge, attitude and skills with regard to ICT and the second one is the lack of application of ICT or reluctant to use ICT in teaching learning process even though many teachers possess proper knowledge, attitude and skills ICT due to some or other reasons. Steps should be taken to provide basic training and develop attitude towards application of technology in education at grass root level. To sum up, it would appear that effective development of ICT skills and knowledge, and enhanced use of ICT in institutions of higher education, requires a holistic approach comprising appropriate training (appropriate in terms of skills, knowledge, relevance to educational goals and priorities, and delivery); ready access to ICT resources; and ongoing support and advice to encourage progression beyond any formal training.

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